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# A Study of Congruence Between the California Achievement Tests and the Curriculum of a Large Midwestern School District

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A STUDY OF CONGRUENCE BETWEEN THE CALIFORNIA ACHIEVEMENT TESTS  
AND THE CURRICULUM OF A LARGE MIDWESTERN SCHOOL DISTRICT

Presented to the  
Department of Educational Administration and Supervision  
and the  
Faculty of the Graduate College  
University of Nebraska

In Partial Fulfillment  
of the Requirements for the Degree  
Specialist in Education

by  
Diana E. Hehir  
August 1986

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## FIELD PROJECT ACCEPTANCE

Accepted for the faculty of the Graduate College, University of Nebraska, in partial fulfillment of the requirements for the degree Specialist in Education, University of Nebraska at Omaha.

Committee	
<u>Darrell Kellams</u> Name	<u>Ed. Admin.</u> Department
<u>Helen Howell</u>	<u>Teacher Education</u>
<hr/>	
<u>[Signature]</u> Chairman	
<u>December 1986</u> Date	

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## Chapter I

### INTRODUCTION

Testing in the schools fulfills many functions. Included in these functions are evaluation of teaching, instructional materials, student progress, and programs. One authority states, "The purpose of evaluation and testing is decision making. Tests--of intelligence, achievement, and personality--provide information for making decisions about continuation, promotion, graduation, special assignment and placement, diagnosis and prescription, student feedback, motivation, and evaluation" (Cardenas, 1977, p. 71).

Two types of tests are often used to assess student progress and instructional effectiveness. Norm-referenced tests or standardized tests are usually developed by a large publishing company to assess student achievement in a variety of curriculums. Standardized or norm-referenced testing possess the following merits:

Achievement measures also convey information about the capability of other students. In instances where a student's relative standing along the continuum of attainment is the primary purpose of measurement, reference need not be made to criterion behavior. Educational achievement examinations, for example, are administered frequently for the purpose of ordering students in a class or school, rather than for assessing their attainment of specified curriculum objectives. When such norm-referenced measures are used, a particular student's achievement is evaluated in

terms of a comparison between his performance and the performance of other members of the group. Such measures need provide little or no information about the degree of proficiency exhibited by the tested behaviors in terms of what the individual can do. They tell that one student is more or less proficient than another, but do not tell how proficient either of them is with respect to the subject matter tasks involved. (Popham, 1971, pp. 8-9)

Some educators feel that standardized tests have been used for purposes other than student evaluation.

The results of standardized tests have been used to make numerous administrative decisions:

1. To transfer a principal.
2. To compare the effectiveness of the total curriculum of different schools.
3. To determine the need for new materials.
4. To gauge the relationship of curriculum goals to particular materials and methods.
5. To evaluate teacher effectiveness.
6. To diagnose an individual student's strengths and weaknesses in particular curriculum areas.
7. To determine admission to private school.
8. To place students into ability groups.
9. To predict an individual student's performance.
10. To reinforce budget priorities.



11. To compare individuals and groups of students to each other.

Frequently, the same test battery supports many, if not all, of these decisions. (Damon, 1980, p. 45)

While standardized tests are designed to assess student achievement and comparatively evaluate a student, they are often used for purposes for which they were not designed. Standardized tests were not designed to assess a particular curriculum or a teacher's instructional effectiveness. For this purpose criterion-referenced tests are used. Criterion-referenced tests are often teacher constructed because:

underlying the concept of achievement measurement is the notion of a continuum of knowledge acquisition ranging from no proficiency at all to perfect performance. An individual's achievement level falls at some point on this continuum as indicated by the behaviors he displays during testing. The degree to which his achievement resembles desired performance at any specified level is assessed by criterion-referenced measures of achievement or proficiency. The standard against which a student's performance is compared when measured in this manner is the behavior which defines each point along the achievement continuum. The term "criterion," when used in this way, does not necessarily refer to final end-of-course behavior. . . .

Along such a continuum of attainment, a student's score on a criterion-referenced measure provides explicit information as to what the individual can or cannot do. Criterion-

referenced measures indicate the content of the behavioral repertoire, and the correspondence between what an individual does and the underlying continuum of achievement. Measures which assess student achievement in terms of a criterion standard thus provide information as to the degree of competence attained by a particular student which is independent of reference to the performance of others.

(Popham, 1971, pp. 7-8)

Criterion-referenced tests could be designed to assess the scope and sequence of a textbook or textbook series. The criterion-referenced test would sample the objective presented in the materials. The teacher could, then, use the data to assess the extent to which the concepts taught were successfully accomplished.

Standardized tests, however, are more frequently used to assess the instructional program. The use of standardized tests to assess a program of instructional effectiveness is fraught with many problems. Foremost among these problems is the congruence of the program materials and the standardized tests. Congruence is the extent that the objectives sampled and presented in the instructional materials are assessed by the tests. Often the scope and sequence organize and treat the objectives in a different order. Concepts taught may not be included on the tests. Concepts included on the tests may not be presented in the curriculum. Also, some concepts which are both tested and taught may only be taught to select groups within a classroom. The relative emphasis of concepts may vary on the tests or

the curricular program. In short, there may be significant discrepancies between the testing and the teaching.

For whatever purposes standardized tests are used, whether it be student evaluation, teacher evaluation, or program evaluation, it is imperative that there be congruence between items tested and curriculum presented.

In a large Midwestern school district, the California Achievement Tests (CAT) are used to evaluate student progress. Can the CAT actually be used for this purpose? Are the tests and the curriculum sufficiently congruent? That is, are the concepts included on the tests presented in the curriculum? The problem is to assess the degree of congruence between the CAT and the school district curriculum?

#### Purpose of the Study

The purpose of this study was to determine the congruence between the second grade curriculum of a large Midwestern school district and the CAT which, ". . . combines the important use of norm-referenced tests with the objectives-based information of criterion-referenced tests" (Harris, 1978, p. 1), with the curriculum taught in a large Midwestern school district.

#### Delimitations

This study is not concerned with the uses of the results of CAT nor is it concerned with the congruence of the tests and curriculum on any grade level other than second grade. The innate ability of any particular group is of no particular concern in this study. Also, learnings presented in previous grades have no particular relevance to this study.

### Limitations

Learnings which other standardized tests sample are beyond the scope of this research.

### Assumptions

This study assumes that there should be congruence between concepts tested by the CAT and the concepts presented, on the second grade level, of this large Midwestern school district.

### Methodology Used

To accomplish the purpose of the study, three curricular areas were analyzed for their congruence with the CAT. These areas were mathematics, reading, and spelling. The following procedures were used:

1. The scope and sequence of each were examined and the specific objectives were identified.
2. The respective sections of the CAT were reviewed to determine if the objectives of the curriculum were tested by the CAT.
3. The percentage of objectives that were tested and were not taught was calculated.
4. The percentage of objectives that were taught and were not tested was calculated.
5. The percentage of objectives that were both tested and taught was calculated.
6. The percentage of objectives that were both taught and tested, but only taught to particular groups, was calculated.
7. A judgment regarding the congruence of the CAT with the curriculum presented was made.

8. A survey was sent to select teachers to see what chapters in spelling, mathematics, and reading had been covered by the time of the CAT and from this information to determine which concepts had been presented before the administration of the CAT.

#### Definition of Terms

1. Norm-referenced tests. Those tests on which a student score is based on percentage of a national norm. These tests were used on a nationwide basis and used by many school districts with varied curriculums.

2. Standardized tests. Were used synonymously with norm-referenced tests.

3. Criterion-referenced tests. Those tests developed by persons in a school district to test specific learnings actually presented in the curriculum.

4. Curriculum. Those subjects made available, by a school district, to the students to study and learn.

5. Scope and sequence. The area presented by a particular subject and the order in which each concept or objective is presented.

## Chapter II

### LITERATURE REVIEW

The purpose of this literature review is to delineate the assets and deficiencies of both norm-referenced and criterion-referenced testing.

Historically norm-referenced tests have been employed as a measure for sorting out various elements which society deemed as undesirable.

. . . the French minister of public instruction commissioned Alfred Binet to construct a test to identify students whose aptitudes were so low that they should be placed in special schools. The U.S. Public Health Service commissioned Goddard to administer the Binet test to immigrants at the receiving station on Ellis Island. The next gathering of destructive test data was during World War I when mental tests were given en masse to draftees. Analysis of these results immediately following the war resulted in their discriminatory use against Blacks--to demonstrate that Blacks had lower IQs than Whites. (McKenna, 1977, p. 7)

Standardized or norm-referenced tests do not seem to be totally congruent with classroom learnings since "test content does not reflect local instructional objectives or specific curriculums. . . . Much of the content is unimportant or irrelevant to anything students need to know or understand" (McKenna, 1977, p. 8). Norm-referenced

tests also seem to be incongruent with some more subtle learnings or skills which teachers are attempting to develop.

Test content measures mainly recall-type learning, neglecting the higher thought processes--analyzing, synthesizing, and drawing generalizations and applying them to new phenomena. The tests give an incomplete picture of student learning progress, because items that all or almost all students have learned are removed from the tests in order to keep the norming procedure statistically sound. (McKenna, 1977, p. 8)

Test items can be unduly confusing for the children as:

The test maker uses a language that is not commonly used in other activities in the real world. Test items are unduly complex and require too many different manipulations: sometimes instructions for the items are unclear. Test vocabularies and illustrations are often unfamiliar to those who are not of white middle-class cultures or for whom English is a second language: that is, the tests are culturally and linguistically biased. Standardized testing uses up inordinate amounts of precious instructional time. Thousands of hours go into testing that might better be used in individualizing instruction and planning for teaching.

(McKenna, 1977, pp. 8-9)

The information gleaned from standardized or norm-referenced testing does not seem to be very useful to the classroom teacher since:

Standardized test scores are meaningless for diagnostic purposes. There is no way of knowing why a child has selected a wrong answer. Is the error due to not being able to decode written words? Does the child understand the task? Does the child's reference framework make for different interpretations? Are there multiple possibilities in the answers? Is there no best answer? Piaget describes the differences in children's conceptual thinking as they pass from the concrete to the abstract developmental stages. Is this the reason for the error? (Mercado, 1980, p. 53)

Norm-referenced testing or standardized testing does have some positive attributes. Norm-referenced testing can provide positive support for the pupil.

Students want and deserve recognition for accomplishment that goes beyond the minimum. If we continually gave only mastery tests, those students who accomplish at a higher level would lose one of the important extrinsic rewards of learning, that is, recognition for such accomplishments.

(Mehrens & Lehmann, 1975, p. 11)

Norm-referenced or standardized tests are also ". . . most helpful in fixed-quota selection decisions . . . a necessary component of program evaluation" (Mehrens & Lehmann, 1975, p. 11). Norm-referenced testing can be more helpful than criterion-referenced testing in that norm-referenced testing has a broader focus than criterion-referenced tests, which makes it more valuable in program evaluation, in that:



. . . in evaluating a program we also would wish to know how effective it is in comparison to other possible programs.

Norm-referenced testing may be more reliable than criterion-referenced testing in that the norm-referenced tests are longer and thus perhaps more reliable than the criterion-referenced tests. (Mehrens & Lehmann, 1975, p. 13)

The norm-referenced tests are easier to give in that: a characteristic of the standardized test that distinguishes it from the teacher-made test is that the standardized test has a uniform procedure with respect to administration.

This procedure refers to the physical arrangements made for the actual testing as well as to the directions employed in administering the test. (Mehrens & Lehmann, 1975, p. 18)

Criterion-referenced tests also have both deficits and attributes. Criterion-referenced tests do possess other negative attributes beside the aforementioned lack of positive pupil support, a narrow focus, and difficulty in administration. Criterion-referenced tests also seem to not be congruent with classroom learnings. Teachers who have worked with criterion-based tests seem to feel that "it is important that objectives be developed at the local level and that they take into consideration the fact that all learning cannot be translated into CRT items" (Blachford, 1977, p. 33). These teachers continue by saying, "evidence is fast accumulating that cognitive processes are measurable but that higher-level thought processes are very difficult to measure" (Blachford, 1977, p. 33). These teachers also caution that, "if we are permitted to formulate the instructional objectives for our own

students, we must use caution in selecting the objectives that meet the personal needs of the particular children we teach" (Blachford, 1977, p. 33).

Two other problems that plague teachers are related to the way criterion-referenced tests are developed and how their results are used. One is that items are developed in a hierarchy of difficulty which almost assures that certain percentages of students will not be able to respond correctly to some items. This flies in the face of the very philosophy of instructional objectives: that all students should be helped to achieve all objectives as fully as possible and that a major purpose of testing ought to be to determine which students need more work on which objectives in order that they may achieve full mastery. The second problem which is closely related to the first, is the use of cutting scores, pass-fail points, or minimal competency levels. Reporting and decision making based on such measures can result in the use of criterion-referenced tests for the sorting and classifying of students--a practice that has been found so objectionable with means, quartiles, and similar statistics in norm-referenced tests. (Blachford, 1977, pp. 33-34)

Criterion-referenced tests are useful in that "criterion levels can be established at any point in instruction where it is necessary to obtain information as to the adequacy of an individual's performance" (Popham, 1971, p. 8). Criterion-referenced tests are also beneficial

in that "measures which assess student achievement in terms of a criterion standard thus provide information as to the degree of competence attained by a particular student which is independent of reference to the performance of others" (Popham, 1971, p. 8).

Aside from being useful in student evaluation, criterion-referenced test "data may also be used to help evaluate (make decisions about) instructional programs" (Popham, 1971, p. 12). Criterion-referenced testing can also prove to be beneficial to the teacher since "the diagnosis of specific difficulties, accompanied by a prescription of certain instructional treatments, is necessary in instruction whether or not a mastery approach to learning is used" (Popham, 1971, p. 21). Also, on a broader level, "criterion-referenced tests can be useful in broad surveys of educational accomplishment such as the National Assessment of Educational Progress or state or local assessment programs."

Norm-referenced tests seem to be easier to administer and involve less work than criterion-referenced tests. Both norm-referenced test and criterion-referenced test advocates lay claim to distinct and definite benefits to the individual student. Neither type of test seems to be totally congruent in concepts tested with local objectives, however, both claim to be useful in program evaluation. It seems as if less emphasis should be put on the value of the program and more emphasis should be put on the learnings and accomplishments of each individual. In order to accomplish this, diagnosis of the individual would be necessary, thus pointing definitely in the direction of the criterion-referenced testing.

Historically, testing was developed and used mainly for the purpose of eliminating undesirable elements of the population. Since the purpose of modern education is not to eliminate undesirable students, but rather provide the majority of the population with the skills necessary to lead a productive life, testing should be used to determine individual needs in order to attain this goal. Testing, therefore, should be congruent with or reflective of the learnings which have taken place in the classroom. In order to assess individual needs and deficits, tests need to be useful diagnostic tools. Even if the test is easy to administer, the only positive attribute should not be recognition for individual accomplishment. The test should be a measurement of objectives presented and also should be a usable tool to determine which objectives taught have not been mastered. Much valuable teaching time is lost in administration of standardized tests, even more would be wasted in the administration of criterion-referenced tests. Development of criterion-referenced tests is also time consuming. Criterion-referenced tests are not always congruent with the objectives taught either and there are a certain percentage of questions that students will not be able to answer because test items are developed with a hierarchy of difficulty. The diagnostic use of the criterion-referenced test is undermined because of this, as it makes it impossible for the teacher to then determine which objective still needs to be mastered by the individual student.

Congruency with local objectives taught is necessary in order for a test to be a useful diagnostic tool, which a teacher can use to determine individual mastery of particular objectives. Whether a test

is norm-referenced or criterion-referenced is unimportant, but the congruency of the test and its usefulness as a diagnostic tool is.

## Chapter III

### METHODOLOGY

In order to test the hypothesis that there is no significant difference in the concepts tested by the California Achievement Test (CAT) and the concepts presented through the second grade curriculum of a large Midwestern school district, a comparative study was conducted of the objectives sampled by the CAT and the objectives listed in the scope and sequence for the second grade spelling, mathematics, and reading curricula. The objectives assessed by the CAT and the objectives listed in the scope and sequences of the various texts used by this school district were tested for significant differences.

First, objectives sampled by the CAT, Form E, Level 12, were categorized according to the instructions stated in the California Achievement Test Coordinator's Handbook (1985). Level 12 was selected as the appropriate test for second grade students. Level 12 sampled the objectives for word analysis, vocabulary, comprehension, spelling, language mechanics, language expression, mathematics computation, mathematics concepts, and mathematics applications.

Second, each textbook curricular objective was categorized and matched with the CAT objectives. The curricular textbooks used were Spell Correctly (1974), Mathematics (1983), and the J. B. Lippincott Reading Series (1981; Level A--Starting Out, Level B--Exploring, Level C--Reaching Higher, Level D--Jumping Up, and Level E--Rolling Along).

Third, the frequency of the objectives measured and taught, measured and not taught, and taught but not measured was calculated.

## Chapter IV

### FINDINGS

In order to determine the congruency between the California Achievement Test and the curricular language arts program, the first comparison made was between the second grade reading, spelling, and language objectives tested and the objectives taught. The objectives tested were listed in the CAT Coordinator's Handbook and presented in Table I. The number of items testing each objective was noted, and the frequency at which each objective was taught was noted.

The curriculum used in this comparison are Spell Correctly Book 2 (1974) and the Lippincott Reading Series (1981). Both the first and the second grade levels of the Lippincott Reading Series were used in order to determine the curricular exposure of the second grade children to objectives taught and objectives tested. The books in the Lippincott Reading Series include: Starting Out--Book A, Exploring--Book B, Reaching Higher--Book C, Jumping Up--Book D, and Rolling Along--Book E.

The first test administered to second grade students is designed to assess word analysis skills. Under CAT Objective 8, consonant clusters, two test items assess initial clusters, one item measures final clusters, one item appraises initial diagraphs, and one item assesses final diagraphs. The Spell Correctly Series includes the study of initial and final consonant clusters in Units 13, 14, and 16. Initial and final diagraphs are studied in Units 15, 16, 17, 27, 28, and 29. The Lippincott Reading Series does not introduce this



Table I

Comparisons of California Achievement Test Objectives  
and Curricular Objectives Taught and Assessed

Objective	CAT	Curriculum	Objective Taught*		Objective Assessed	
			Yes	No	Yes	No
Test 1 WORD ANALYSIS	x	x	x		x	
08 Consonant Clusters,	x	x	x		x	
Diagraphs/Oral	x	x	x		x	
initial clusters	x	x	x		x	
final clusters	x	x	x		x	
initial diagraphs	x	x	x		x	
final diagraphs	x	x	x		x	
12 Long Vowels	x	x	x		x	
14 Short Vowels	x	x	x		x	
15 Diphthongs, Variant	x	x	x		x	
Vowel Sounds	x	x	x		x	
diphthongs	x	x	x		x	
r-controlled	x	x	x		x	
schwa	x	x	x		x	
16 Sight Words/Oral	x	x	x		x	
17 Compound Words	x	x	x		x	
18 Root Words, Affixes	x	x	x		x	
inflectional endings	x	x	x		x	
Test 2 VOCABULARY	x	x	x		x	
24 Synonyms	x	x	x		x	
25 Antonyms	x	x	x		x	
28 Words in Context	x	x	x		x	
Test 3 COMPREHENSION	x	x	x		x	
Literal Comprehension	x	x	x		x	
32 Passage Details	x	x	x		x	
who	x	x	x		x	
what	x	x	x		x	
where	x	x	x		x	
when, sequence	x	x	x		x	
Inferential Comprehension	x	x	x		x	
35 Character Analysis						
feeling	x	x	x		x	
36 Central Thought						
main idea	x	x	x		x	
37 Interpreting Events						
conclusions	x	x	x		x	

\*taught to children reading on the second grade level

Table I (continued)

Objective	CAT	Curriculum	Objective Taught*		Objective Assessed	
			Yes	No	Yes	No
Test 4 SPELLING	x	x	x		x	
40 Vowel Sounds	x	x	x		x	
long	x	x	x		x	
diagraphs	x	x	x		x	
diphthongs	x	x	x		x	
r-controlled	x	x	x		x	
long y with long e						
or i sound	x	x	x		x	
irregular spellings	x			x	x	
41 Consonant Sounds	x	x	x		x	
variant letter and						
letter combinations	x	x	x		x	
silent letters	x	x	x		x	
42 Structural Units						
affixes	x	x	x		x	
Test 5 LANGUAGE MECHANICS						
Capitalization						
43 Pronoun I, Nouns,						
Adjectives	x	x	x		x	
44 Beginning Words,						
Titles*	x	x	x		x	
Punctuation						
45 Period, Question Mark,						
Exclamation Point	x	x	x		x	
Test 6 LANGUAGE EXPRESSION	x	x	x		x	
Usage						
48 Nouns						
singular						
plural	x	x	x		x	
49 Pronouns						
personal	x	x	x		x	
50 Verbs						
agreement						
tense	x	x	x		x	
51 Adjectives, Adverbs						
modifier/adjective	x	x	x		x	
Sentence Structure						
52 Sentence Formation						
statement to question						
sentence completion	x	x	x		x	

\*taught to children reading on the second grade level

Table I (continued)

Objective	CAT	Curriculum	Objective Taught*		Objective Assessed	
			Yes	No	Yes	No
Test 7 MATHEMATICS COMPUTATION						
59 Addition of Whole Numbers	x	x	x		x	
62 Subtraction of Whole Numbers	x	x	x		x	
Test 8 MATHEMATICS CONCEPTS AND APPLICATIONS	x	x	x		x	
73 Numeration						
ordinality	x	x	x		x	
fractional parts	x	x	x		x	
recognize numbers	x	x	x		x	
comparisons	x	x	x		x	
counting numbers	x			x	x	
sequences, patterns	x			x	x	
expanded notation						
place value	x	x	x		x	
76 Problem Solving						
pre-solution	x	x	x		x	
one-step	x	x	x		x	
77 Measurement						
money	x	x	x		x	
calendar	x	x	x		x	
time	x	x	x		x	
capacity	x	x	x		x	
78 Geometry						
symmetry	x	x	x		x	
points, lines,						
segments, rays*	x			x	x	
plane figures	x	x	x		x	
	73	69	69	4	73	

\*taught to children reading on the second grade level

objective until Book B which treats this objective on six pages, continues in Book C on 19 pages, and again in Book D on 50 pages.

The second CAT objective under word analysis is objective 12--long vowels. Thirteen test questions are used to measure this objective. In the Spell Correctly Series long vowels are presented in Units 8, 9, 20, 22, and 25. The Lippincott Reading Series first introduces this objective in Book B on 24 pages, reviews it in Book C on 22 pages, in Book D on 19 pages, and then in Book E on 16 pages.

The third objective tested under word analysis is Objective 14, short vowels. Seven test items are designed to assess this objective. The Spell Correctly Series presents the study of short vowels in Chapters 2, 3, 4, 5, 7, 33, 34, and 35. The Lippincott Reading Series introduces short vowels in Book A on 16 pages, continues in Book B on 3 pages, in Book C on 6 pages, and in Book D on 11 pages.

Under Objective 15--diphthongs and variant vowel sounds, two items sample diphthongs, four measure r-controlled vowels, and one item tests the schwa sound--the Spell Correctly Series assigns the study of diphthongs in Chapters 31, 32, 33, and 35. R-controlled vowels are studied in Chapters 25, 26, 27, 28, 29, and 34. The schwa is studied in Chapter 6. The Lippincott Reading Series does not present the study of these objectives until Book C which devotes 35 pages to these objectives, then Book D devotes 22 pages, and Book E continues with 19 more pages.

Objective 16, sight words/oral, is assessed by four test items. The Spell Correctly Series does not deal with this concept. Rather, children are required to write words and sentences dictated by the

teacher each week. The Lippincott Reading Series presents this concept beginning in Book A and continuing through the entire series on numerous vocabulary check-up pages found in the correlating work books.

The sixth objective tested under word analysis is compound words. Five test items assess knowledge of compound words. The Spell Correctly Series includes the study of compound words in Units 27 and 30. The Lippincott Reading Series introduces the study of compound words first in Book C on 3 pages, in Book D on 1 page, and again in Book E on 1 page.

The last objective tested under word analysis is Objective 18-- root words, affixes, and inflectional endings. Four test items check knowledge in this area. The Spell Correctly Series assigns the study of base or root words in Chapters 13, 25, 34, and 35. Suffixes are studied extensively in spelling. The Spell Correctly Series uses 20 chapters to present and review various suffixes. The Lippincott Reading Series first introduces root words, prefixes, and suffixes in Book C on 3 pages, continues the study in Book D on 4 pages, and in Book E on 6 pages.

Test 2, Vocabulary, tests three different objectives. Objective 24, synonyms, checks the children's knowledge with 20 test items. The Spell Correctly Series presents the study of synonyms in Chapters 20 and 29. The Lippincott Reading Series begins the study of synonyms in Book C on 4 pages, in Book D on 2 pages, and in Book E on 3 pages.

The second objective tested under vocabulary is Objective 29, antonyms. Five test items check understanding of antonyms. The Spell Correctly Series presents the study of antonyms in Chapters 4, 5, 7,

8, 20, 23, 28, and 32. The Lippincott Reading Series first introduces antonyms in Book C on 2 pages, in Book D on 2 pages, and in Book E on 4 pages.

The third objective tested under vocabulary is Objective 28, words in context. Five test items determine understanding of words in context. The Spell Correctly Series devotes some part of each unit in the book to working with words in context. The Lippincott Reading Series begins presenting contextual clues in Book A on 3 pages, Book B on 2 pages, Book C on 4 pages, Book D on 2 pages, and in Book E on 3 pages.

Test 3 of the Level 12 CAT test is Comprehension. Objectives tested through the comprehension test are basically reading skills, rather than spelling, therefore a comparison will only be made between the test objectives and the Lippincott Reading Series.

Literal comprehension is tested first. Objective 32--passage details or selection of the phrase who, what, when, where--measures literal comprehension. Twelve test items verify knowledge of this objective. The Lippincott Reading Series introduces this objective in Book A on 3 pages, in Book B on 2 pages, in Book C on 2 pages, in Book D on 2 pages, and in Book E on 1 page.

Inferential comprehension is the second type of comprehension tested. Three category objectives are used to determine understanding of this area. Objective 35--character analysis, feeling--is the first of the inferential comprehension objectives. Six test items measure understanding of this objective. The Lippincott Reading Series

introduces this objective first in Book C on 2 pages, again in Book D on 2 pages, and in Book E on 2 pages.

Objective 36, central thought or main idea, is the second area of inferential comprehension. Six test items appraise knowledge of this objective. The Lippincott Reading Series introduces this objective first in Book C on 2 pages, continues in Book D on 3 pages, and in Book E on 3 pages.

Objective 37--interpreting events, conclusions--is the third objective that tests inferential comprehension. Six test items survey knowledge of this objective. The Lippincott Reading Series introduces this objective in Book A on 2 pages, in Book B on 1 page, in Book C on 3 pages, in Book D on 1 page, and in Book E on 1 page.

Test 4 of the level 12 CAT test is Spelling. Since most of the objectives tested in Spelling are a repetition of objectives tested in Test 1, Word Analysis, only the number of items testing the objectives will be listed. Comparisons and the frequency of presentation in the spelling and reading curriculum text were listed for only those concepts which were not repeated.

Objective 40, vowel sounds, is the first objective tested under Test 4, Spelling. Objective 40 includes three test items to measure knowledge of long vowel sounds, three test items appraising knowledge of diagraphs, two test items to assess diphthongs, three test items checking r-controlled sounds, two test items assessing knowledge of long y with long e or i sound, and one test item measuring knowledge of irregular spellings. Long y with long e or i sound is the first concept not also assessed in Test 1, Word Analysis. The Spell

Correctly Series presents the study of long y with the long e or i sound in Units 8, 20, 25, and 35. The Lippincott Reading Series introduces this concept in Book C on 4 pages and continues the study in Book D on 7 pages. Irregular spellings was the second concept tested under Objective 40 that was not also assessed in Test 1. Neither the Spell Correctly Series nor the Lippincott Reading Series introduced this concept.

Objective 41, consonant sounds, was the second objective assessed under Test 4, Spelling. Four test items were included to measure knowledge of variant letter and letter combinations and five test items were included to check knowledge of silent letters. The Spell Correctly Series does not introduce either variant letter and letter combinations or silent letters. The Lippincott Reading Series introduces variant letters and letter combinations in Book C on 20 pages and continues this study in Book D on 9 pages. The Lippincott Reading Series also introduces silent letters in Book D on 4 pages and in Book E on 5 pages.

Objective 42--structural units, affixes--is the third objective assessed on Test 4, Spelling. Seven test items are designed to measure this objective. Structural units, affixes, are also tested on Test 1, Word Analysis.

Test 5 of the CAT Level 12 test is Language Mechanics. Test 5 measures three objectives. Objective 43 appraises the understanding of capitalization of the pronoun I, nouns, and adjectives. Ten test items measure this objective. The Spell Correctly Series does not introduce this objective. The Lippincott Reading Series introduces



capitalization in Book A on 2 pages, in Book B on 1 page, in Book C on 7 pages, in Book D on 7 pages, and in Book E on 9 pages.

Objective 44--capitalization of beginning words, titles--is the second objective measured on Test 5. Ten test items appraise this objective. The Spell Correctly Series does not present this objective. The Lippincott Reading Series introduces this objective in Book A on 1 page, in Book B on 2 pages, in Book C on 7 pages, in Book D on 7 pages, and in Book E on 9 pages.

Objective 45 was the third objective measured on Test 5. Objective 45 checked knowledge of periods, question marks, and exclamation points as punctuation marks. Ten test items appraised this knowledge. The Spell Correctly Series does not consider this objective. Lippincott introduces the concept of periods, question marks, and exclamation points in Book A on 5 pages, Book B on 3 pages, Book C on 7 pages, Book D on 4 pages, and in Book E on 7 pages.

Test 6 of the CAT Level 12 test is Language Expression. Five objectives are included on Test 6 to appraise knowledge in this area.

Objective 48, usage of singular and plural nouns, is the first objective under language expression. Six test items are designed to measure knowledge of this objective. The Spell Correctly Series develops the concept of singular and plural nouns in 17 of its 32 chapters. The Lippincott Reading Series introduces this objective in Book A on 1 page, in Book B on 5 pages, in Book C on 4 pages, in Book D on 1 page, and in Book E on 1 page.

Objective 49, usage of personal pronouns, is the second objective assessed on Test 6. Five test items are included to appraise knowledge

in this area. The Spell Correctly Series does not deal with this objective. The Lippincott Reading Series first introduces this objective in Book B on 1 page, in Book C on 2 pages, in Book D on 1 page, and in Book E on 2 pages.

Objective 50, verb agreement and tense, is the third objective measured by Test 6, Language Expression. Five test items are designed to assess knowledge of this objective. The Spell Correctly Series does not include this objective. The Lippincott Reading Series introduces this objective in Book B on 2 pages, in Book C on 2 pages, in Book D on 2 pages, and in Book E on 4 pages.

Objective 51--adjectives, adverbs modifier/adjective--is the fourth objective tested on Test 6, Language Expression. Six test items are designed to measure knowledge of this objective. The Spell Correctly Series does not include this objective. The Lippincott Reading Series introduces this objective in Book B on 2 pages, in Book C on 2 pages, in Book D on 2 pages, and in Book E on 2 pages.

Objective 52--sentence formation, statement to question, and sentence completion--is the first objective tested on Test 6, Language Expression. Eight test items evaluate knowledge of this objective. The Spell Correctly Series does not introduce this objective. The Lippincott Reading Series introduces this objective in Book A on 4 pages, in Book B on 3 pages, in Book C on 8 pages, in Book D on 4 pages, and in Book E on 6 pages.

In order to determine the congruency between the California Achievement Test and the curricular mathematics program, the second comparison made was between the second grade mathematics category

objectives tested and the objectives taught. The objectives tested by the CAT Coordinator's Handbook were listed (see Table I), the number of items testing each objective was noted, the chapters in which each objective was taught was noted, and the frequency of which each objective was taught was recorded.

Test 7 of the CAT Level 12 test is Mathematics Computation. Two category objectives were comprised to measure knowledge of mathematics computation skills.

Objective 59, addition of whole numbers, is the first objective measured on Test 7. Twelve test items measure knowledge of addition of whole numbers. The Heath Mathematics Series introduces this objective in Chapter 1 on 15 pages, in Chapter 3 on 27 pages, in Chapter 6 on 20 pages, and in Chapter 12 on 11 pages.

Objective 62, subtraction of whole numbers, is the second objective tested on Test 7, Mathematics Computation. Twelve test items measure knowledge of this objective. The Heath Mathematics Series introduces this objective in Chapter 1 on 11 pages, in Chapter 4 on 15 pages, in Chapter 7 on 9 pages, and in Chapter 12 on 6 pages.

Test 8 in the CAT Level 12 Test measures mathematical concepts and applications. Four category objectives were included to measure knowledge of mathematical concepts and applications.

Objective 73, numeration, is the first objective included on Test 8. Seven concepts are tested under Objective 73. The first concept is numeration which included one test item designed to measure knowledge of this concept. The Heath Mathematics Series introduces this concept in Chapter 2 on 3 pages. Fractional parts is the next

concept measured under Objective 73. Two test items are designed to measure this concept. The Heath Mathematics Series introduces the study of this concept in Chapter 8 on 12 pages. The third concept tested under Objective 73 is recognition of numbers. One test item is designed to assess knowledge in this area. The Heath Mathematics Series introduces recognition of numbers in Chapter 2 on 12 pages and in Chapter 11 on 6 pages. The fifth concept tested under Objective 73 is comparisons. One test item appraises knowledge of this concept. The Heath Mathematics Series introduces numerical comparisons in Chapter 2 on 2 pages and in Chapter 11 on 2 pages. The sixth concept tested under Objective 73 is counting numbers. One test item is designed to assess knowledge of this concept. The Heath Mathematics Series does not introduce this concept. The seventh concept tested under Objective 73 is sequences, patterns. One test item is included to measure knowledge of this concept. The Heath Mathematics Series does not include study of this concept. The eighth concept measured under Objective 73 is expanded notation. Five test items are designed to assess knowledge of this concept. The Heath Mathematics Series introduces the concept of expanded notation in Chapter 2 on 6 pages. The ninth concept assessed under Objective 73 is place value. Four test items measure this concept. The Heath Mathematics Series introduces the concept of place value in Chapter 2 on 6 pages and in Chapter 11 on 2 pages.

Objective 76, problem solving, is the second objective included on Test 8, Mathematics Concepts and Applications. Three concepts are measured under Objective 76. Pre-solution problem solving is the

first concept measured under Objective 76. One test item is designed to assess this concept. The Heath Mathematics Series introduces pre-solution problem solving in Chapter 1 on 1 page and in Chapter 6 on 2 pages. One-step problem solving is the second concept measured under Objective 76. Five test items are included to appraise this concept. The Heath Mathematics Series introduces one-step word problems in Chapter 1 on 5 pages, in Chapter 3 on 3 pages, in Chapter 4 on 4 pages, in Chapter 6 on 6 pages, in Chapter 7 on 6 pages, and in Chapter 12 on 5 pages. Using graphs to solve word problems is the third concept measured under Objective 76. Three test items assess this concept. The Heath Mathematics Series introduces solving word problems using graphs in Chapter 1 on 2 pages, in Chapter 3 on 3 pages, in Chapter 4 on 1 page, and in Chapter 6 on 1 page.

Objective 77, measurement, is the third objective included in Test 8, Mathematics Concepts and Applications. Four concepts are measured under Objective 77. Identification of money is the first concept measured under Objective 77. Two test items assess the child's ability to identify money. The Heath Mathematics Series introduces the identification of money in Chapter 2 on 2 pages, in Chapter 5 on 6 pages, and in Chapter 11 on 4 pages. The calendar is the second concept measured under Objective 77. One test item assesses knowledge of the calendar. The Heath Mathematics Series introduces the study of the calendar in Chapter 2 on 1 page. Capacity is the fourth concept tested under Objective 77, measurement. One test item is included to measure knowledge of capacity. The Heath

Mathematics Series introduces the study of capacity in Chapter 5 on 8 pages and in Chapter 9 on 3 pages.

Objective 78, geometry, is the fourth objective included on Test 8, Mathematics Concepts and Applications. Three concepts are measured under Objective 78. Symmetry is the first concept assessed under this objective. One test item is included to assess knowledge of symmetry. The Heath Mathematics Series introduces symmetry in Chapter 9 on 4 pages. Points, lines, segments, and rays are the second concept tested under Objective 78, geometry. One test item assesses knowledge of this concept. The Heath Mathematics Series does not introduce the study of points, lines, segments, and rays. Plane figures is the third concept measured under Objective 78, geometry. Two test items are incorporated to measure this concept. The Heath Mathematics Series introduces the study of plane figures in Chapter 9 on 4 pages.

Comparison between the second grade reading, spelling, language, and mathematics category objectives tested and the objectives taught demonstrated that 100% of the language arts and mathematics objectives tested were also taught. One concept in language arts and three concepts in mathematics were found to be tested but not taught. From this information, it was ascertained that 97% of the language arts concepts and 84% of the mathematics concepts were taught.

In order to determine which language arts and mathematics curricular objectives were taught but not tested, the scope and sequence of the Spell Correctly Series, the Lippincott Reading Series, and the Heath Mathematics Series were reexamined and the results were tabulated (see Table II).

Table II

Comparisons of School District Curricular Scope and SequenceObjectives, Objectives Taught, and Assessed

Objective	CAT	Curriculum	Objective Taught		Objective Assessed		
			Yes	No	Yes	No	
SOUNDS AND PATTERNS							
01 Vowel Sounds	x	x	x		x		
02 Vowel-r Sounds	x	x	x		x		
03 Consonant Sounds	x	x	x		x		
04 Consonant Clusters	x	x	x		x		
STRUCTURE AND MEANING							
05 Word Building Units	x	x	x		x		
initial-consonant substitution							
final-consonant substitution							
vowel substitution							
06 Word Meaning	x	x	x		x		
words in context							
antonyms							
synonyms							
homophones							
compound words							
07 Word Structure	x	x	x		x		
base words							
identifying syllables							
regular verb forms							
irregular verb forms							
plural forms of nouns							
irregular plural forms of nouns							
08 Pre-dictionary skills		x	x			x	
letter sequence							
alphabetizing by the first letter							
alphabetizing by the second letter							
alphabetizing by the third letter							
thinking of the dictionary in four parts							

Table II (continued)

Objective	CAT	Curriculum	Objective Taught		Objective Assessed	
			Yes	No	Yes	No
09 Picture Dictionary		x	x			x
alphabetical order						
alphabetizing by the first and second letters						
use of information from dictionary entry						
entries giving more than one meaning						
10 Dictionary Skills		x	x			x
choosing appropriate meanings of words with multiple meanings						
finding and using guide words						
finding entry words						
finding inflected forms in entries						
11 Decoding Sound/Symbol Relationships	x	x	x		x	
LANGUAGE ANALYSIS						
12 Word Structure	x	x	x		x	
capitalization						
rhyme						
inflected ending						
singular/plural						
possessive						
punctuation: apostrophe						
abbreviation						
base word						
contraction						
compound words						
syllabication						
comparative/superlative						
suffix						
accent						
prefix						
punctuation: hyphen						
13 Word Function	x	x	x		x	
noun						
verb						
adjective						
pronoun						
multiple parts of speech						



Table II (continued)

Objective	CAT	Curriculum	Objective Taught		Objective Assessed	
			Yes	No	Yes	No
14 Sentence Structure	x	x	x		x	
identification of sentence						
capitalization						
punctuation: period						
comma						
question mark						
exclamation mark						
colon/semicolon						
dash/ellipsis						
quotation marks						
phrase						
paragraphing						
subject/predicate						
declarative sentences						
exclamatory sentences						
imperative sentences						
interrogative sentences						
COMPREHENSION						
15 Vocabulary Development	x	x	x		x	
word meaning						
multiple meanings						
question words						
antonyms						
homophones						
idion/colloquialism						
16 Literal Comprehension	x	x	x		x	
detail						
picture detail						
sequence						
characterization						
comparison						
main idea						
cause/effect						
17 Inferential Comprehension	x	x	x		x	
predicting outcomes						
drawing conclusions						
cause/effect						
main idea						
figurative language						
classification						
comparison						
characterization						
sequence						

Table II (continued)

Objective	CAT	Curriculum	Objective Taught		Objective Assessed	
			Yes	No	Yes	No
18 Evaluative Comprehension sense/nonsense reality/fantasy		x	x			x
19 Oral Language discussion retelling/paraphrasing expressive reading dramatization		x	x			x
20 Written Language letter formation letter dictation word dictation phrase dictation sentence dictation composition creative writing		x	x			x
LITERARY ANALYSIS/APPRECIATION		x	x			x
21 Genres fiction: fantasy/science fiction historical folk tale/fable adventure/mystery realistic poetry: rhymed non-fiction: how-to expository biography/autobiography interview riddles/jokes play						
22 Story Elements characterization setting plot		x	x			x
23 Poetry Element rhyme scheme		x	x			x
24 Study Skills identification of book parts: title contents page dictionary skills: alphabetizing						

Table II (continued)

Objective	CAT	Curriculum	Objective Taught		Objective Assessed	
			Yes	No	Yes	No
24 Study Skills (continued)						
following directions						
glossary						
definition						
guide words						
parts of speech						
interpreting diagrams						
25 Place Value and Counting	x	x	x		x	
counting and writing numerals						
ordinal numbers through 8						
place value through 19						
place value through 99						
numbers in table form						
order of numbers through 99						
comparisons						
counting on the number line						
1 more 1 less						
skip counting by 2, 5, and 10						
counting money						
odd and even numbers						
place value through 999						
order of numbers through 999						
10 or 100 more, 10 or 100 less						
comparing using <, >, and =						
26 Adding Whole Numbers	x	x	x		x	
sums through 10						
order property of addition						
adding in horizontal form						
families of facts						
sums through 18						
adding money						
missing addends						
three or more addends						
adding two-digit numbers						
adding three-digit numbers						
27 Subtracting Whole Numbers	x	x	x		x	
subtracting from 10 or less						
subtracting in horizontal form						
subtracting two-digit numbers						
subtracting three-digit numbers						

Table II (continued)

Objective	CAT	Curriculum	Objective Taught		Objective Assessed	
			Yes	No	Yes	No
28 Multiplying Whole Numbers skip-counting by 2, 5, and 10 repeated addition basic facts through 5 x 5 multiplying money order property		x	x			x
29 Dividing Whole Numbers division readiness		x	x			x
30 Fractions fractions and regions one half one third one fourth non-unit fractions identifying and writing fractional parts fractions and sets	x	x	x		x	
31 Decimals decimal system of money adding and subtracting money in decimal form		x	x			x
32 Problem Solving and Applications getting information from a bar graph collecting and organizing data comparisons choosing the operation getting information from tables completing and solving word problems short-phase problems word problems two-step problems consumer mathematics making change	x	x	x		x	
33 Geometry like shapes cube, sphere, cone, cylinder circle, square, rectangle, triangle congruent figures symmetry	x	x	x		x	

Table II (continued)

Objective	CAT	Curriculum	Objective Taught		Objective Assessed	
			Yes	No	Yes	No
34 Measurement, Time, and Money	x	x	x		x	
money: penny, nickle, dime, quarter, half-dollar, dollar						
time: calendar, to the hour, half-hour, nearest 5 minutes						
linear measurement						
centimeter ruler						
perimeter						
measuring perimeter						
liquid measurement						
liter						
cup, pint, quart						
weight						
kilogram						
pound						
temperature						
35 Probability, Statistics, and Graphing	x	x	x		x	
reading a bar graph						
reading a table						
making a table						
	22	35	35		22	13

The first consideration was the scope and sequence of the Spell Correctly Series. It was found that 7 of the 10 areas or 70% of the objectives listed in the scope and sequence for Book 2 of the Spell Correctly Series were both taught and tested.

Fifty percent of the objectives studied in the Spell Correctly Series under structure and meaning were both taught and tested. Objective 5--word building units, 6--word meaning, and 7--word structure, were all presented by both the Spell Correctly Series and assessed by the CAT Level 12 Test. Homophones, a concept presented under Objective 6, word meaning, was the only concept taught by the Spell Correctly Series that was not assessed by the CAT.

Fifty percent of the objectives studied in the Spell Correctly Series under structure and meaning were taught but not assessed. Objective 8, pre-dictionary skills, were taught but not assessed by the CAT. Under Objective 8, pre-dictionary skills, it was found that the Spell Correctly Series included instruction in letter sequence in six chapters, alphabetizing by the first letter in six chapters, alphabetizing by the second letter in five chapters, alphabetizing by the third letter in three chapters, and thinking of the dictionary in four parts in one chapter.

Objective 9 was the second objective under structure and meaning that was taught but not tested. Under Objective 9, picture dictionary, the Spell Correctly Series developed concepts of alphabetical order in three chapters, alphabetizing by the first and second letters in one chapter, using information from the dictionary entry in three chapters, and entries giving more than one meaning in three chapters.

Objective 10 was the third objective under structure and meaning that was taught but not tested. Under Objective 10, the Spell Correctly Series developed concepts of choosing appropriate meanings of words with multiple meanings in seven chapters, finding and using guide words in five chapters, finding entry words in three chapters, and finding inflected forms in entries in two chapters.

The second consideration was a reexamination of the scope and sequence of the Lippincott Reading Series to determine which concepts were taught but not tested on the second grade level (see Table II). It was found that 67% of the concepts listed in the scope and sequence of the Lippincott Reading Series Books A through E were both taught by the Lippincott Reading Series and tested by the CAT Level 12 Test.

One hundred percent of Objective 11, decoding/sound symbol relationships (see Table II), were both taught and tested.

Three objectives are included in the Lippincott Reading Series under language analysis. Objective 12, word structure, is the first objective listed under language analysis. It was determined that 9 of the 16 or 56% of the concepts introduced by the Lippincott Reading Series were also assessed by the CAT. The seven concepts that were taught but not tested include rhyme, possessive words, abbreviation, contractions, syllabication, comparative/superlative words, and the hyphen as a punctuation mark.

Objective 13, word function, was the second objective included under language analysis. One hundred percent of the word function concepts taught were tested.

Objective 14, sentence structure, is the third objective included under language analysis. Of the 16 sentence structure concepts introduced by the Lippincott Reading Series, 11 or 68% were both taught and assessed. The five concepts that were taught but not tested included the colon and semicolon as punctuation marks, the dash and the ellipsis as punctuation marks, recognition of a phrase, paragraphing, and the understanding of the subject/predicate.

Six objectives are listed under comprehension by the Lippincott Reading Series. Objective 15, vocabulary development, is the first objective under comprehension. Of the six concepts used by the Lippincott Reading Series in vocabulary development, four or 66% are both taught and tested. The two concepts that are taught but not tested were homophones and idiom/colloquialism.

Objective 16, literal comprehension, is the second objective under comprehension. Of the seven concepts introduced under literal comprehension, four or 57% were both taught and tested. Those concepts which were taught but not tested include detail, picture detail, and sequence.

Objective 17, inferential comprehension, is the third objective included under comprehension. Nine concepts are introduced by the Lippincott Reading Series under inferential comprehension. Of these nine concepts, six or 66% of the concepts are both taught and tested. The three concepts introduced but not assessed were figurative language, classification, and sequence.

Objective 18, evaluative comprehension, is the fourth objective in the area of comprehension. Of the two concepts taught by the



Lippincott Reading Series under this objective, neither was tested. These concepts taught but not tested were sense/nonsense and reality/fantasy.

Objective 19, oral language, is the fifth objective incorporated into the area of comprehension. The four concepts taught by the Lippincott Reading Series were not assessed at all by the CAT. These concepts were discussion, retelling/paraphrasing, expressive reading, and dramatization.

Objective 20 is the sixth objective that comprises the area of comprehension. The Lippincott Reading Series teaches seven concepts under this objective. None of these objectives are assessed by the CAT. These concepts include letter formation, letter dictation, word dictation, phrase dictation, sentence dictation, composition, and creative writing.

Four objectives are included in the Lippincott Reading Series under literary analysis/appreciation. Objective 21, genres, is the first literary analysis/appreciation objective. Of the 12 concepts taught by the Lippincott Reading Series in the development of this objective, none are appraised by the CAT. These concepts include fiction: fantasy/science fiction, historical, folk tale/fable, adventure/mystery, realistic, poetry; rhymed, non-fiction: how-to, expository, biography/autobiography, interview, riddles/jokes, and plays.

Objective 22, story elements, is the second literary analysis/appreciation objective. Of the three concepts taught by the Lippincott Reading Series to develop this objective, none are

assessed by the CAT. These concepts include characterization, setting, and plot.

Objective 23, poetry elements, is the third literary analysis/appreciation objective. The Lippincott Reading Series uses one concept to develop this objective on the second grade level. This concept is not appraised by the CAT Level 12 Test. The concept taught by the Lippincott Reading Series to develop the objective of poetry elements is rhyme scheme.

Objective 24, study skills, is the third literary analysis/appreciation objective. The Lippincott Reading Series uses nine concepts to develop this objective. None of the nine concepts were assessed by the CAT. The nine concepts are identification of the title page as a book part, identification of the contents page as a book part, alphabetizing, following directions, glossary, definition, guide words, parts of speech, and interpreting diagrams.

The third consideration was a reexamination of the scope and sequence of the Heath Mathematics Series in order to determine which curricular objectives were taught but not tested (see Table II). It was found that 91% of the curricular concepts taught were also tested.

Objective 25, place value and counting, is the first of the mathematics objectives. Of the 16 concepts taught through the Heath Mathematics Series to achieve this objective, 10 concepts or 63% were also assessed by the CAT. The six concepts that were not appraised include order of numbers through 99, one more one less, skip counting by 2, 5, and 10, odd and even numbers, order of numbers through 999, and 10 or 100 more, 10 or 100 less.

Objective 26, adding whole numbers, is the second mathematics objective. Of the 10 concepts presented by the Heath Mathematics Series to teach this objective, 100% were also assessed by the CAT.

Objective 27, subtracting whole numbers, was the third mathematics objective. Of the four concepts employed by the Heath Mathematics Series to teach this objective, all were also measured by the CAT.

Objective 28, multiplying whole numbers, was the fourth mathematics objective considered. Five concepts were used by the Heath Mathematics Series to teach this objective. None of these concepts were assessed by the CAT. The five concepts not assessed were skip-counting by 2, 5, and 10, repeated addition, basic facts through  $5 \times 5$ , multiplying money, and order property.

Objective 29, dividing whole numbers, was the fifth mathematics objective listed in the scope and sequence of the Heath Mathematics Series. The one concept used by the Heath Mathematics Series to achieve this objective was not assessed by the CAT. This concept was division readiness.

Objective 30, fractions, was the sixth mathematics objective listed. The Heath Mathematics Series employs seven concepts to teach this objective. One hundred percent of these concepts were assessed by the CAT.

Objective 31, decimals, was the seventh objective listed. The Heath Mathematics Series used two concepts to teach this objective. Neither one of these two concepts were assessed by the CAT. The two concepts used by the Heath Mathematics Series to teach decimals were

the decimal system of money and adding and subtracting money in decimal form. -

Objective 32, problem solving and applications, was the eighth mathematics objective. The Heath Mathematics Series uses 11 concepts to teach this objective. One hundred percent of these 11 concepts were appraised by the CAT.

Objective 33, geometry, was the ninth mathematics objective. The Heath Mathematics Series introduces five concepts under this objective. Of these five concepts, 100% were measured by the CAT.

Objective 34--measurement, time, and money--was the 10th mathematics objective. The Heath Mathematics Series includes six concepts under this objective. Of these six concepts, five or 83% were assessed by the CAT. The concept not assessed was linear measurement.

Objective 35--probability, statistics, and graphing--was the 11th mathematics objective listed in the Heath Mathematics Series scope and sequence. Three concepts are used by this series to teach Objective 35. One hundred percent of these concepts are measured by the CAT.

To assess teacher perceptions of the curricular objectives listed in the scope and sequence of the spelling, reading, and mathematics series which second grade children had been taught at the time of the CAT, a questionnaire was developed and mailed to 120 teachers (see Appendix A). Eighty usable responses were received.

From the information on the questionnaire returned, it was determined that most of the respondents were on or around the same

unit in the Spell Correctly Series (see Table III). Unit 29 had been completed by 47.5% at the time of the CAT. Unit 28 had been completed by 22.5%, Unit 27 by 8.25%, Unit 26 by 2.5%, Unit 25 by 2.5% and Unit 24 by 1.25%. Fifteen percent of the respondents indicated that they had completed more units than Unit 29 at the time of testing. Unit 30 had been completed by 7.5%, Unit 31 by 4%, Unit 33 by 2.5%, Unit 34 by 1.25%, and Unit 36 (the complete text) by 2.5%. Spelling objectives taught and tested would have been introduced before Unit 29 in the Spell Correctly Series. Sixty-two percent of the respondents had indicated completion of Unit 29.

From the information on the questionnaires returned (see Table IV), it was found that 50% of the respondents had one group reading in each of Books E, D, and C. Eight percent of the respondents had one group reading in Book E and two groups reading in Book D. Seven percent of the respondents had a group reading in each of Book D, Book C, and Book B. Six percent had one group reading in Book E and two groups reading in Book C. Five percent of the respondents had groups reading in Book E, Book D, and Book B and 5% had one group reading in Book D and two groups reading in Book C. Two percent of the respondents had two groups reading in Book E and one group reading in Book C. One percent of the respondents had indicated two groups in Book E and one in D, one group in Book D and two groups in Book C, two groups in Book D and one group in Book C, and one group in each of Books E, C, and B. One percent of the respondents also indicated three groups reading in Book D, two groups reading in Book D and one in Book B, one group reading in Book E and one in D, two groups reading in Book E, one

Table III

Spell Correctly Units Completed

Units Completed	Number of Respondents
24	1
25	2
26	2
27	7
28	18
29	38
30	6
31	1
32	0
33	2
34	1
35	0
36	2

Table IV

Reading Group Placement and Time of CAT Testing

Reading Groups				
Book A	Book B	Book C	Book D	Book E
		40	40	40
			14	7
	6	6	6	
		10		5
	4		4	4
		8	4	
		2		4
			1	2
		2	1	
		1	2	
	1	1		1
			3	
	1		2	
			1	1
				2
			1	
	1	1		
				3
				1
2*	13	71	79	70

\*this number indicated two children for whom the teachers already tallied above had to make a fourth reading group

group reading in Book D, one group reading in Book C and one in Book B, three groups reading in Book E, and one reading group in Book E.

From the questionnaire, it was also ascertained that 70 groups were reading in Book E, 79 groups were reading in Book D, 71 groups were reading in Book C, 13 groups were reading in Book B, and 2 children were reading in Book A.

Information on the questionnaire returned revealed that 32.5% of the respondents had completed Units 1 through 11 in the Heath Mathematics Series, 21.25% of the respondents had completed through Unit 10, 21.25% had completed the book, 16.25% had completed Units 1 through 9, 2.5% had completed Units 1 through 8, 5% had completed Units 1 through 7, and only 1% had only completed the mathematics series through Unit 5 (see Table V). Since no new concepts are introduced by the Heath Mathematics Series after Unit 10, it can be judged that 60 classrooms or 75% of the classrooms had been presented with all of the objectives found to be taught by the Heath Mathematics Series and tested by the CAT.

It has been found that those mathematical objectives, spelling objectives, and reading objectives both taught and tested have been presented to a large percentage of the children in each area. Since mathematics and spelling instruction on the primary level is not grouped all of the children in this large percentage of classrooms should have been exposed to mathematics and spelling objectives taught. Since reading is grouped on the primary level, this is the only curricular area in which the entire class would not have been exposed to all concepts taught. It can be determined that children reading in



Table V

Respondent Teachers' Mathematics Placement

Mathematics Unit	Number of Respondents Completing Each Unit
5	1
6	0
7	4
8	2
9	13
10	17
11	26
12	17

Books E, D, and C of the Lippincott Reading Series would have received instruction in those concepts both tested and taught (see Table I).

The objectives for reading were again listed and exposure to each objective was noted for the 13 groups reading in Book B and the 2 children in Book A. The percentage of objectives to which these two groups had not been exposed were then calculated (see Table VI).

Children reading in the Lippincott Reading Series Book B (see Table VI) would have encountered 52% of CAT Test 1, Word Analysis, as unfamiliar material. Fifty percent of Objective 8--consonant clusters, diagraphs/oral--would have been unfamiliar concepts to children reading in Book B since they would have not been instructed in initial and final diagraphs at the time. Thirty-three percent of Objective 15--diphthongs, variant vowels sounds--would be unfamiliar material to children reading in Book B as they would not have received instruction in diphthongs at the time of the CAT. One hundred percent of Objective 17, compound words, and 100% of Objective 18--root words, affixes, inflectional endings--would have been concepts to which children reading in the Lippincott Series Book B would not have received instruction.

Sixty-six percent of Test 2, Vocabulary, would have been unfamiliar material to children reading in Lippincott Book B as they would not have been instructed on Objective 24, synonyms or Objective 25, antonyms.

Twenty-five percent of Test 3, Comprehension, would have been unfamiliar material to children reading in the Lippincott Reading

Table VI

CAT Objectives Taught to Groups Reading in Book B

Objective	CAT	Curriculum	Objective Taught*		Objective Assessed	
			Yes	No	Yes	No
Test 1 WORD ANALYSIS						
08 Consonant Clusters, Diagraphs/Oral initial clusters final clusters initial diagraphs final diagraphs	x	x		x	x	
12 Long Vowels	x		x		x	
14 Short Vowels	x		x		x	
15 Diphthongs, Variant Vowel Sounds diphthongs r-controlled schwa	x	x	x		x	
16 Sight Words/Oral	x		x		x	
17 Compound Words	x			x	x	
18 Root Words, Affixes inflectional endings	x	x		x	x	
Test 2 VOCABULARY						
24 Synonyms	x	x		x	x	
25 Antonyms	x	x		x	x	
28 Words in Context	x	x	x		x	
Test 3 COMPREHENSION						
Literal Comprehension						
32 Passage Details who what where when, sequence	x	x	x		x	
Inferential Comprehension						
35 Character Analysis feeling	x	x		x	x	
36 Central Thought main idea	x		x		x	
37 Interpreting Events conclusions	x		x		x	

\*taught to children reading in the Lippincott Reading Series Book B

Table VI (continued)

Objective	CAT	Curriculum	Objective Taught*		Objective Assessed	
			Yes	No	Yes	No
Test 4 SPELLING						
40 Vowel Sounds						
long						
diagraphs						
diphthongs						
r-controlled						
long y with long e						
or i sound						
irregular spellings	x			x	x	
41 Consonant Sounds						
variant letter and						
letter combinations						
silent letters	x	x		x	x	
42 Structural Units						
affixes	x	x	x		x	
Test 5 LANGUAGE MECHANICS						
Capitalization						
43 Pronoun I, Nouns,						
Adjectives	x		x		x	
44 Beginning Words,						
Titles	x		x		x	
Punctuation						
45 Period, Question Mark,						
Exclamation Point	x		x		x	
Test 6 LANGUAGE EXPRESSION						
Usage						
48 Nouns						
singular						
plural	x	x	x		x	
49 Pronouns						
personal	x	x	x		x	
50 Verbs						
agreement						
tense	x	x	x		x	
51 Adjectives, Adverbs						
modifier/adjective	x	x	x		x	
Sentence Structure						
52 Sentence Formation						
statement to question						
sentence completion	x	x	x		x	
	25	25	17	8	25	

\*taught to children reading in the Lippincott Reading Series Book B

Series Book B. Children reading in Book B would not have received any instruction on Objective 26--character analysis, feeling.

Seventy-seven percent of Test 4, Spelling, would have been unfamiliar concepts to children reading in the Lippincott Reading Series Book B. Objective 40 would have presented Book B children with 66% of unfamiliar material as they would not have received instruction on diagraphs, diphthongs, long y with long e or i sound at the time of testing. One hundred percent of Objective 41, consonant sounds, would have been unfamiliar concepts to children reading in the Lippincott Reading Series Book B. Children reading in Book B would not have received instruction on variant letter and letter combinations or silent letters at the time of testing. One hundred percent of Objective 42, structural units, would be new material to children reading in the Lippincott Reading Series Book B as they would not have received instruction on affixes at the time of testing.

Ten percent of Test 5, Language Mechanics, would have been unfamiliar material to children reading in the Lippincott Reading Series Book B. These children would not have received instruction on capitalizing titles under Objective 44--capitalization of beginning words, titles.

One hundred percent of the Test 6, Language Expression, would have been familiar concepts to children reading in the Lippincott Reading Series Book B.

It was found that even a greater percentage of unfamiliar material was experienced by those children reading in the Lippincott Reading Series Book A (see Table VII).

Eighty percent of the material assessed by the CAT Test 1, Word Analysis, was unfamiliar to children reading in the Lippincott Reading Series Book A. One hundred percent of Objective 8, consonant clusters, was unfamiliar since children reading in Book A would not have received instruction in initial consonant clusters, final consonant clusters, initial diagraphs, or final diagraphs at the time of the CAT. One hundred percent of Objective 12, long vowels, would have been new material to those children reading in the Lippincott Reading Series Book A. These children would have not received instruction on long vowels at the time of the CAT. One hundred percent of Objective 14, short vowels, would have been familiar material to children reading in Book A since they would have received instruction in short vowels before the time of the CAT. Sixty-six percent of Objective 15--diphthongs, variant vowel sounds--would be unfamiliar concepts to children reading in the Lippincott Reading Series Book A. Diphthongs and r-controlled vowels are two concepts which would not have been presented to children reading in Book A at the time of testing. One hundred percent of Objective 16, sight-words/oral, would have been familiar material to children reading in the Lippincott Reading Series Book A. One hundred percent of Objective 17, compound words, would have been unfamiliar to children reading in Book A since they would not have received instruction on compound words at the time of testing. One hundred percent of Objective 18 would be unfamiliar material to

Table VII

CAT Objectives Taught to Children Reading in Book A

Objective	CAT	Curriculum	Objective Taught*		Objective Assessed	
			Yes	No	Yes	No
Test 1 WORD ANALYSIS						
08 Consonant Clusters, Diagrams/Oral initial clusters final clusters initial diagrams final diagrams	x	x		x	x	
12 Long Vowels	x	x		x	x	
14 Short Vowels	x	x	x		x	
15 Diphthongs, Variant Vowel Sounds diphthongs r-controlled schwa	x	x		x	x	
16 Sight Words/Oral	x	x	x		x	
17 Compound Words	x	x		x	x	
18 Root Words, Affixes inflectional endings	x	x		x	x	
Test 2 VOCABULARY						
24 Synonyms	x	x		x	x	
25 Antonyms	x	x		x	x	
28 Words in Context	x	x	x		x	
Test 3 COMPREHENSION						
Literal Comprehension						
32 Passage Details who what where when, sequence	x	x	x		x	
Inferential Comprehension						
35 Character Analysis feeling	x	x		x	x	
36 Central Thought main idea	x			x	x	
37 Interpreting Events conclusions	x	x	x		x	

\*taught to children reading in the Lippincott Reading Series Book A

Table VII (continued)

Objective	CAT	Curriculum	Objective Taught*		Objective Assessed	
			Yes	No	Yes	No
Test 4 SPELLING						
40 Vowel Sounds						
long						
diagraphs						
diphthongs						
r-controlled						
long y with long e						
or i sound						
irregular spellings	x	x		x	x	
41 Consonant Sounds						
variant letter and						
letter combinations						
silent letters	x	x		x	x	
42 Structural Units						
affixes	x	x		x	x	
Test 5 LANGUAGE MECHANICS						
Capitalization						
43 Pronoun I, Nouns,						
Adjectives	x	x		x	x	
44 Beginning Words,						
Titles	x	x	x		x	
Punctuation						
45 Period, Question Mark,						
Exclamation Point	x	x	x		x	
Test 6 LANGUAGE EXPRESSION						
Usage						
48 Nouns						
singular						
plural	x	x		x	x	
49 Pronouns						
personal	x	x		x	x	
50 Verbs						
agreement						
tense	x	x		x	x	
51 Adjectives, Adverbs						
modifier/adjective	x	x		x	x	
Sentence Structure						
52 Sentence Formation						
statement to question						
sentence completion	x	x	x		x	
	25	25	8	17	25	

\*taught to children reading in the Lippincott Reading Series Book A



those children reading in the Lippincott Reading Series Book A. Root words, affixes, and inflectional endings would not have been introduced to these children before the CAT was administered.

Sixty-six percent of Test 2, Vocabulary, would have been new concepts to children reading in the Lippincott Reading Series Book A. One hundred percent of Objective 24, synonyms, and 100% of Objective 25, antonyms, would be unfamiliar concepts to children reading in Book A inasmuch as synonyms and antonyms would not have been introduced at the time of testing. One hundred percent of Objective 28, words in context, would have been introduced to the children reading in Book A before the CAT was given.

Fifty percent of Test 3, Comprehension, would have been unfamiliar material to children reading in the Lippincott Reading Series Book A. One hundred percent of Objective 32, passage details, would be material to which children reading in Book A would have been introduced. One hundred percent of Objective 35--character analysis, feeling--and 100% of Objective 36--central thought, main idea--would be unfamiliar material and concepts which had not been introduced to children reading in Book A at the time of testing. Objective 37--interpreting events, conclusions--would have been the second objective in Test 3, Comprehension, which would have been familiar material to those children reading in the Lippincott Reading Series Book A. Children reading in Book A would have been introduced to interpreting events, conclusions, prior to the time of the CAT.

One hundred percent of Test 4, Spelling, would have been unfamiliar material to children reading in the Lippincott Reading Series Book A.

Objective 40, vowel sounds, which includes the concepts long vowels, diagraphs, diphthongs, r-controlled vowels, long y with long e or i sound, and irregular spellings would be an objective that children reading in Book A would have not received any instruction at the time of testing. One hundred percent of Objective 41, consonant sounds, which includes concepts of variant letter and letter combinations and silent letters would be material which children in Book A would have received no instruction prior to the time of testing. One hundred percent of Objective 42--structural units, affixes--would also be curricular material on which children reading in Book A would have not received instruction prior to the CAT.

Fifty percent of Test 5, Language Mechanics, would also be unfamiliar material to those children reading in the Lippincott Reading Series Book A. One hundred percent of Objective 43--capitalization of the pronoun I, nouns, and adjectives--would be concepts to which children reading in Book A would not have been introduced at the time of testing. Fifty percent of Objective 44, capitalization of beginning words and titles, would be unfamiliar concepts as children reading in Book A would not have been instructed in capitalization of titles. One hundred percent of Objective 45--the period, question mark, and exclamation points--would be familiar concepts inasmuch as each of these concepts are introduced in Book A.

Eighty percent of Test 6, Language Expression, would be unfamiliar material to children reading in the Lippincott Reading Series Book A. One hundred percent of Objective 48, singular and plural nouns, would be concepts to which children reading in Book A would not have been

introduced. One hundred percent of Objective 49, personal pronouns, would also be unfamiliar material to children reading in Book A. One hundred percent of Objective 50, verb agreement and verb tense, would be concepts to which children reading in Book A had not been introduced. One hundred percent of Objective 51--adjective, adverbs modifier/ adjectives--would be concepts in which children reading in Book A would have not received instruction at the time of testing. One hundred percent of Objective 52--sentence formation, statement to question and sentence completion--were concepts to which children in Book A had been introduced.

## Chapter V

### SUMMARY AND RECOMMENDATIONS

The purpose of this study was to determine the congruency between the CAT with the second grade curriculum taught in a large Midwestern school district. This study was not concerned with the evaluation of teaching, instructional materials, or even with actual progress made by individual students. The sole purpose of this study was to determine if the degree of congruency between the CAT and the curriculum taught in this large Midwestern school district was great enough that it could be used as a tool to measure pupil progress. Whether the CAT was a norm-referenced or criterion-referenced test or both, as it claimed to be, was also unimportant. The important factor of this study was to determine if the CAT which "combines the important use of norm-referenced tests with the objectives-based information of criterion-referenced tests" (Harris, 1973, p. 1) was actually reflective of the curriculum taught by this school district.

Through the comparison of the mathematics objectives tested and the mathematics objectives taught it was determined that 91% of the concepts tested were taught and that 88% of the concepts taught were also tested. This indicated a high degree of congruency between the CAT and the mathematics text used by the district.

Comparison of the CAT word analysis, vocabulary, comprehension, spelling, language mechanics, and language expression test objectives and the objectives taught by the reading and spelling series. These comparisons were made together because the district does not employ a

language series on the second grade level at this time and because of the high degree of correlation between objectives taught in the reading and spelling series used.

Sixty-three percent of the areas listed in the scope and sequence of Spell Correctly were both tested and taught. Thirty-seven percent of the areas listed in the scope and sequence were taught, but not tested.

Through comparison of the concepts listed as taught in the scope and sequence of the Lippincott Reading Series Books A-E and objectives tested in reading, spelling, and language on the CAT, Level 12 Test, it was determined that children in Books A-E were taught 29% of concepts that were taught but not tested. It was also determined that while children in Lippincott Books D and E were tested on almost 100% of the concepts they had been taught and should have mastered at the time of testing, children reading in Lippincott Book C were being tested on a large percentage of newly introduced skills studied. It was also found that children reading in Lippincott Book B were tested by the CAT on a large percentage of concepts in reading and spelling which had not been taught and a significant percentage of concepts in language concepts which was also unfamiliar. Children reading in Lippincott Book A were tested by the CAT on a large percentage of concepts that had not been taught in all areas of reading, spelling, and language.

It was determined through the survey that only two teachers had children reading in Lippincott Book A. Only 14% of the respondents indicated that some of their children were reading in Lippincott Book

B. Seventy percent of the respondents indicated that they had children reading in Lippincott Book C. Eighty-four percent of the respondents indicated that some of their children were reading in Lippincott Book D. At least 70% of the respondents indicated having children reading in Lippincott Book E. According to the survey, progress in mathematics, reading, or spelling was not dependent upon school locale. A large percentage of teachers were teaching the same units in both spelling and mathematics at the time of the CAT. Children reading in Lippincott Books A, B, and C did represent a cross-section of the school community.

#### Recommendations

1. In preparation for the CAT in mathematics, second grade teachers could extend the unit in geometry to include points, lines, segments, and rays, and also to continue skipping the ~~m~~ultiplication chapter until after the time of testing, when it can then be used for enrichment.

2. For spelling, the recommendation would be to the district to adopt a new spelling and language series, which should be adaptable to the reading level of all second grade students. In doing so, perhaps those children reading in Lippincott Books A, B, and C would be able to have an understanding of some of the spelling and language objectives which they have not yet mastered or been taught in reading.

3. In reading, the recommendation is also directed at the school district that those children reading in Lippincott Books A and B either receive further testing to determine the reason that they are still reading in what are essentially first grade texts or be either

exempt from the reading part of the CAT or be given the first grade level of the CAT in reading. This part of the test must be extremely frustrating to children who have not been introduced to a great percentage of the objectives. Also, a teacher should not expect to or be expected to use a test as a diagnostic tool which checks children's knowledge of material to which they have never been introduced.

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## Appendix A

Dear \_\_\_\_\_:

In order to complete my study of congruence between the California Achievement Tests and the curriculum of second grade, information about the objectives covered by various groups in different schools is needed. I would greatly appreciate your completion of the following checklist. Enclosed is a stamped, self-addressed envelope. Thank you for your cooperation.

Sincerely,

*Diana Hehir*  
Diana Hehir

Please list the approximate page in each area at the time of the California Achievement Test.

Spelling: page \_\_\_\_\_Mathematics: page \_\_\_\_\_Reading (top group)Book \_\_\_\_\_  
name of text or level

Page \_\_\_\_\_

Reading (middle group)Book \_\_\_\_\_  
name of text or level

Page \_\_\_\_\_

Reading (low group)Book \_\_\_\_\_  
name of text or level

Page \_\_\_\_\_

May 14, 1986

Approved by Dr. Irving C. Young upon the approval of Dr. Cornelius Jackson, Principal, Belvedere Elementary.

Approved: \_\_\_\_\_

*Cornelius Jackson*  
Dr. Cornelius Jackson

Date: \_\_\_\_\_

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